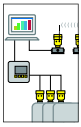
Operating Instructions

VEGACONNECT 4 with connection box

Interface converter USB - HART/I²C

Document ID:
32628



Signal
conditioning instruments
and communication

Contents

1 About this document

1.1 Function 3
1.2 Target group 3
1.3 Symbolism used 3

2 For your safety

2.1 Authorised personnel 4
2.2 Appropriate use 4
2.3 Warning about misuse 4
2.4 General safety instructions 4
2.5 Safety label on the instrument 5
2.6 CE conformity 5
2.7 Safety instructions for Ex areas 5
2.8 Environmental instructions 5

3 Product description

3.1 Configuration 6
3.2 Principle of operation 7
3.3 Operation 8
3.4 Packaging, transport and storage 8

4 Connection

4.1 Connection to the PC 9
4.2 Connection of the sensor/signal conditioning instrument 10

5 Connection examples

5.1 Connection via I²C interface 13
5.2 Connection via HART 15

6 Setup

6.1 Operation 17

7 Maintenance and fault rectification

7.1 Maintenance 18
7.2 Instrument repair 18

8 Dismount

8.1 Dismounting steps 19
8.2 Disposal 19

9 Supplement

9.1 Technical data 20
9.2 Dimensions 21
9.3 Industrial property rights 22
9.4 Trademark 22

32628-EN-091118

1 About this document

1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup as well as important instructions for maintenance and fault rectification. Please read this information before putting the instrument into operation and keep this manual accessible in the immediate vicinity of the device.

1.2 Target group

This operating instructions manual is directed to trained qualified personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbolism used

Information, tip, note
This symbol indicates helpful additional information.

Caution: If this warning is ignored, faults or malfunctions can result.
Warning: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.
Danger: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.

Ex applications
This symbol indicates special instructions for Ex applications.

- **List**
  The dot set in front indicates a list with no implied sequence.

→ **Action**
This arrow indicates a single action.

1 **Sequence**
Numbers set in front indicate successive steps in a procedure.

2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the plant operator.

During work on and with the device the required personal protective equipment must always be worn.

2.2 Appropriate use

VEGACONNECT 4 is an interface converter for connecting a PC to communication-capable VEGA instruments.

You can find detailed information on the application range in chapter "*Product description*".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

2.3 Warning about misuse

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

This is a high-tech instrument requiring the strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating instructions manual, the country-specific installation standards as well as all prevailing safety regulations and accident prevention rules.

The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for trouble-free operation of the instrument.

During the entire duration of use, the user is obliged to determine the compliance of the required occupational safety measures with the current valid rules and regulations and also take note of new regulations.

32628-EN-091118

2.5 Safety label on the instrument

The safety approval markings and safety tips on the device must be observed.

2.6 CE conformity

This device fulfills the legal requirements of the applicable EC guidelines. By attaching the CE mark, VEGA provides a confirmation of successful testing. You can find the CE conformity declaration in the download area of www.vega.com.

2.7 Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

2.8 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfil this obligation by observing the environmental instructions in this manual:

- Chapter "*Packaging, transport and storage*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGACONNECT 4 interface converter
- Connection box with two connection cables
- USB cable
- I^2C adapter
- 2 x connection terminals
- Documentation
  - this operating instructions manual
  - Ex-specific "*Safety instructions*" (with Ex-versions)
  - if necessary, further certificates

Components

VEGACONNECT consists of the following components:

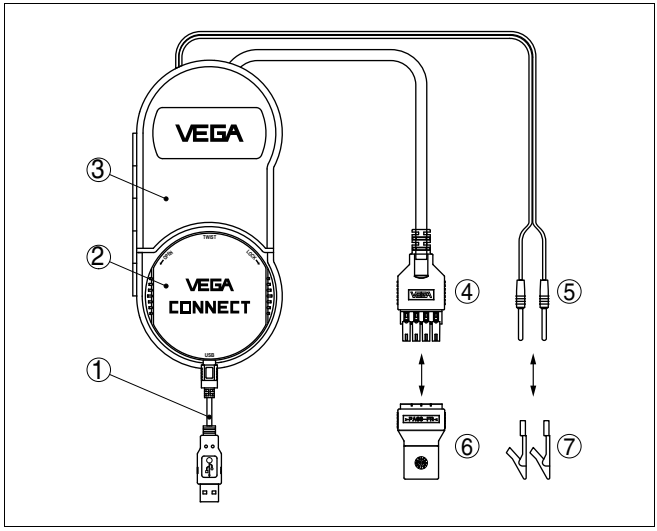


Fig. 1: Configuration VEGACONNECT

1 USB cable
2 VEGACONNECT 4
3 Connection box with storage space
4 I^2C bus cable
5 HART cable with 2 mm pins
6 I^2C adapter for series 50 sensors
7 2 x terminals for cable with 2 mm pins

Type label

The type label contains the most important data for identification and use of the instrument:

- Article number
- Serial number

32628-EN-091118

- Technical data
- Article numbers, documentation

The serial number allows you to access the delivery data of the instrument via www.vega.com, "*VEGA Tools*" and "*serial number search*".

3.2 Principle of operation

Application area

VEGACONNECT 4 is an interface converter for connection of communication-capable VEGA instruments to the USB interface of a PC. It can also be used as a universal HART modem for sensors from other manufacturers. An adjustment software such as PACTware with VEGA DTMs is required for parameter adjustment of these instruments.

VEGACONNECT 4 can be connected to the following VEGA instruments. All currently available electronics versions are supported (HART, Profibus PA, Foundation Fieldbus). When instruments from the plics® series are used, VEGACONNECT 4 can be inserted directly into the respective instrument.

- VEGAPULS radar sensors
- VEGASON ultrasonic sensors
- VEGAFLEX guided microwave
- VEGABAR process pressure transmitter
- Pressure transmitter D series
- Capacitive electrode EL/EK
- VEGADIS indicating instruments
- VEGAMET signal conditioning instruments
- Wireless Gateways PLICSRADIO

Connection cable, adapter and terminals for connection to the different instrument series are attached to all VEGACONNECT 4. These adapters can be kept in the storage space of the connection box.

Functional principle

The VEGACONNECT 4 interface converter is connected via the USB connection to a PC. It converts the signals and protocols of the USB interface into the corresponding signal/protocol of the connected instrument. The following systems are supported:

- 4 … 20 mA with superimposed HART protocol
- Profibus PA via I^2C protocol
- Foundation Fieldbus via I^2C protocol

Power supply

Voltage supply of VEGACONNECT 4 is provided via the USB interface of the PC.

Detailed information about the power supply can be found in chapter "*Technical data*".

3.3 Operation

The adjustment is carried out via a Windows PC with a parameter adjustment software such as PACTware with respective DTM. There are no adjustment elements on the instrument itself.

3.4 Packaging, transport and storage

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test according to DIN EN 24180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Transport

Transport must be carried out under consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

Transport inspection

The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

Storage

Up to the time of installation, the packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages must be stored only under the following conditions:

- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration

Storage and transport temperature

- Storage and transport temperature see chapter "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 … 85 %

4 Connection

4.1 Connection to the PC

Connection

Note:
First of all you should install the driver before connecting VEGACONNECT 4 to the PC.

An USB interface (1.1 or 2.0) is compulsory for connection of VEGACONNECT 4 to a PC. The connection is provided with the supplied USB cable. Voltage supply of VEGACONNECT 4 is provided via the USB interface.

If the supplied USB cable is replaced by another one, make sure that the insulation thickness of the cable is over 0.65 mm.

Driver

To operate VEGACONNECT 4, a suitable driver is required which is included on the CD "*DTM Collection*". As an alternative, the software is also available free-of-charge from our homepage. You should always use the latest version to ensure the support of all instrument functions. The system requirements for operation correspond to those of the "*DTM Collection*" or of PACTware.

When installing the driver package "*VEGA-DTM for Communication*", the suitable instrument driver is installed automatically. When connecting VEGACONNECT 4, the driver installation is finished automatically and is ready for operation without a restart.

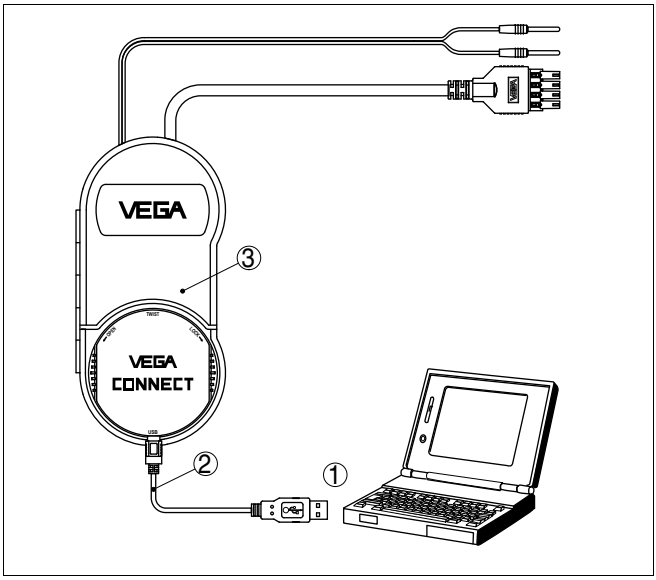


Fig. 2: Electrical connection

1 USB 1.1 or 2.0 connection of the PC
2 USB connection cable (in the scope of delivery)
3 VEGACONNECT 4 with connection box

4.2 Connection of the sensor/signal conditioning instrument

VEGACONNECT 4 can be connected to virtually all communication-capable VEGA instruments. With instruments of the plics® series it can be mounted directly into the sensor. In this case, you can remove VEGACONNECT 4 out of the connection box and insert it into the plics® device instead of the indicating and adjustment module.

Connection to all instrument series can be provided without problems via the supplied adapters.

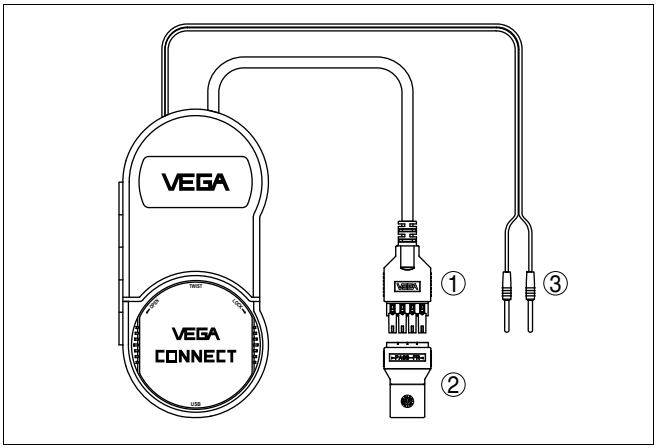


Fig. 3: Connection possibilities

Communication via I²C protocol

- Use of VEGACONNECT 4 in all plics® sensors through direct installation (see connection examples)
- For connection to the I²C (Com.) interface of all plics® sensors, connection 1
- For connection to the I²C interface instead of the adjustment module MINICOM (VEGAPULS 40, 50, VEGAFLEX 50, VEGASON 50 series), connection 2

Communication via HART protocol

- For connection to the 4 … 20 mA cable (an additional HART resistor will be required depending on voltage supply/processing), connection 3

In hazardous Ex areas, the HART or I²C cable of VEGACONNECT 4 can be connected to an Ex approved sensor. VEGACONNECT 4 and the PC must not be located in Ex area.

Connection via I²C bus

VEGACONNECT 4 can be connected to the I²C bus interface of the following sensors.

- all sensors of plics® series
- VEGAPULS series 40, 50 from software version 4.00.00
- VEGASON series 50 from software version 4.00.00
- VEGAFLEX series 50 from software version 4.00.00
- VEGACAP from software version 1.10
- EL/EK (PA) with electronics module CAPE34
- VEGADIS 50/61

Note:
The connection of Profibus PA or Foundation Fieldbus instruments is always carried out via the I^2C interface on the sensor. A direct connection of VEGACONNECT 4 on the Fieldbus is not possible.

Connection via HART

The connection via the sensor cable can be carried out on any HART sensor. Depending on the processing system, an additional HART resistor is required (see "*Connection examples - Connection via HART*").

5 Connection examples

5.1 Connection via I²C interface

In hazardous Ex areas, the HART or I²C cable of VEGACONNECT 4 can be connected to an Ex approved sensor. VEGACONNECT 4 and the PC must not be located in Ex area.

Installation in plics® series

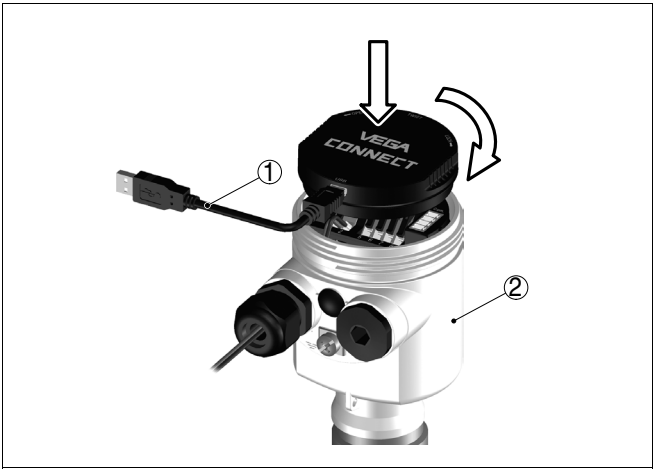


Fig. 4: Installation and connection in plics® device

1 USB cable
2 plics® device

External connection plics® series

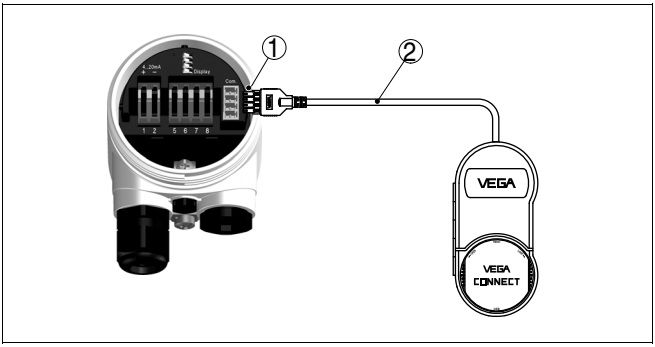


Fig. 5: Connection plics® series via I²C interface

1 I²C bus (Com.) interface
2 I²C connection cable

VEGADIS 61

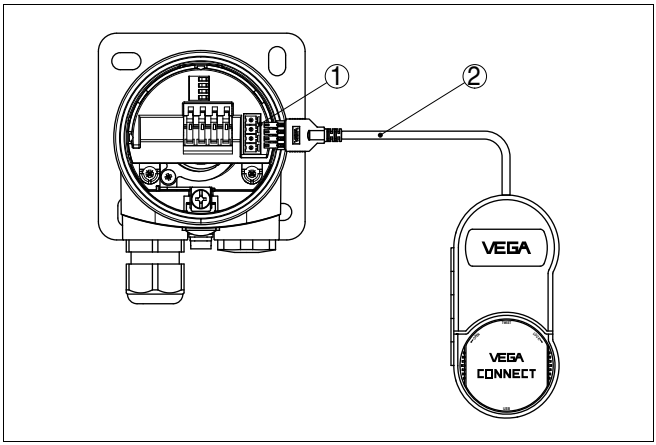


Fig. 6: Connection VEGADIS 61 via I²C interface

1 I²C bus (Com.) interface
2 I²C connection cable

If the sensors in the HART or Profibus system are connected with a digital VEGADIS 61 indicating instrument, VEGACONNECT 4 can be connected to the I²C bus interface of VEGADIS 61.

VEGA series 50 sensors

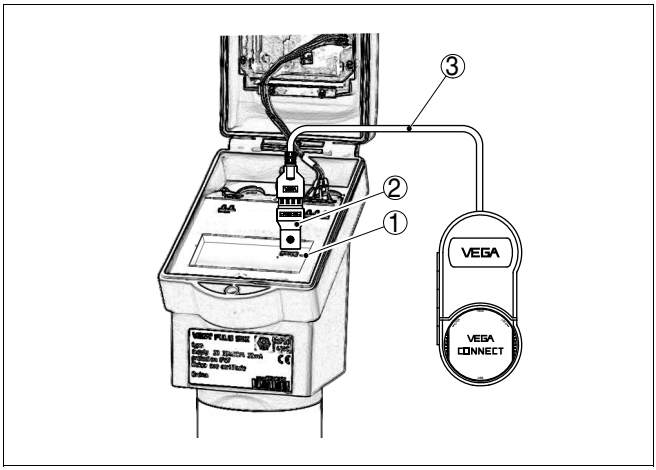


Fig. 7: Connection series 50 via I²C interface

1 I²C bus (Com.) interface
2 I²C bus adapter for series 50
3 I²C connection cable

VEGAMET 624/625, VEGASCAN 693

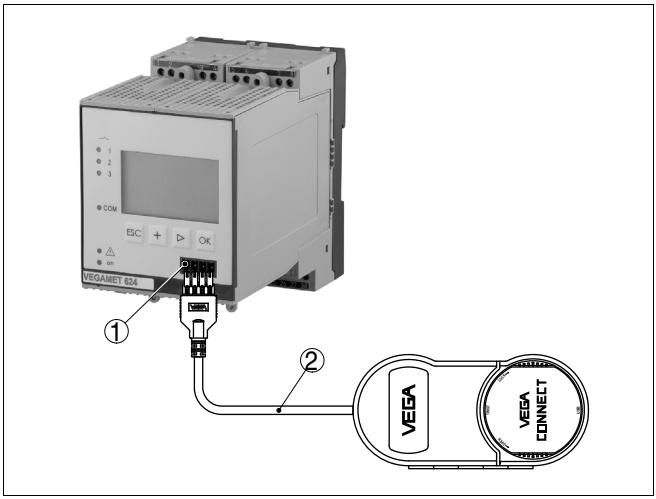


Fig. 8: Connection VEGAMET/VEGASCAN via I²C interface

1 I²C bus (Com.) interface
2 I²C connection cable

Note:
Communication with the sensor is carried out with VEGAMET 624/625 and VEGASCAN 693 also via the front I²C interface of the signal conditioning instrument. The connection of VEGACONNECT 4 directly to the 4 … 20 mA sensor cable is not possible.

5.2 Connection via HART

HART communication

If the resistance of the connected processing system is less than 230 Ω, the digital adjustment signal is extremely damped or short-circuited. Digital communication with the PC is then no longer possible. With low impedance processing systems, a resistance of approx. 230 Ω must be integrated into the 4 … 20 mA connection cable. The connection can be either carried out in parallel to the sensor or via the resistor.

Note:
When connecting to a VEGAMET 381, VEGADIS 371 or VEGATRENN 149 there is no additional HART resistor required. These instruments have also connection sockets for direct connection of the 2 mm pins.

When using VEGAMET 624/625, VEGASCAN 693 signal conditioning instruments, the connection cannot be carried out via the sensor cable. The parameter adjustment of the signal conditioning instrument as well as of the sensor can be carried out via the I²C connection sockets.

HART sensor with VEGAMET 381

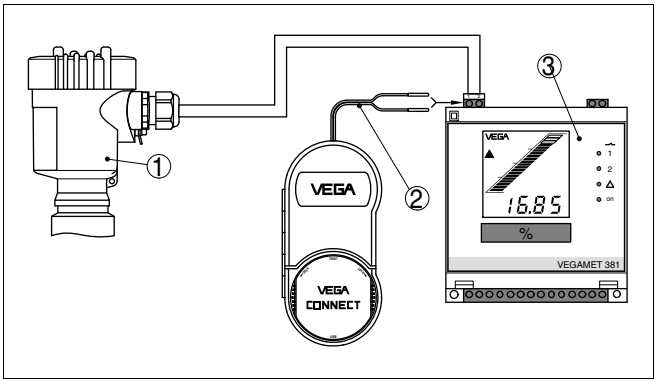


Fig. 9: Connection plics® series via HART

1 HART sensor
2 Connection cable with 2 mm pins
3 VEGAMET 381 or VEGADIS 371

HART sensor on a PLC

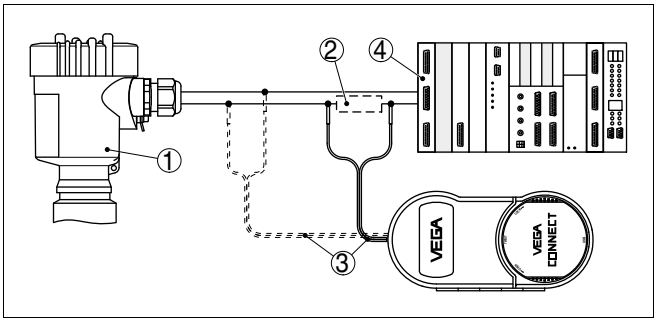


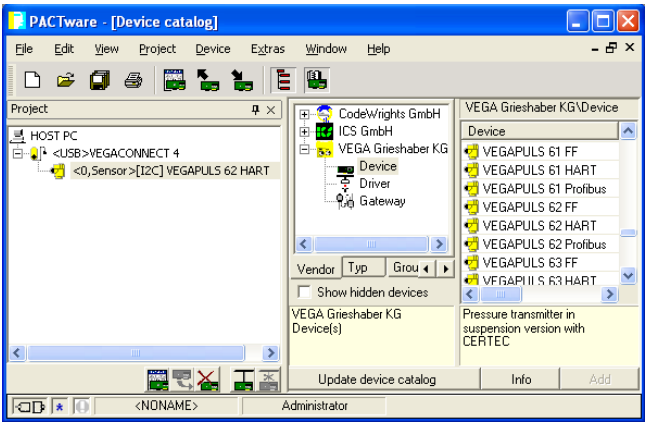
Fig. 10: Connection plics® series via HART

1 HART sensor
2 HART resistance 230 Ω (optional depending on processing)
3 Connection cable with 2 mm pins and terminals
4 Processing system/PLC/Voltage supply

6 Setup

6.1 Operation

Use and adjustment are described in the operating instructions manual as well as in the online help of PACTware and the VEGA-DTMs as well as in the respective device instructions manual.



Information:
You find the VEGACONNECT 4 DTM in the device catalogue under the group "*Driver*". When adding a HART sensors, the window "*Channel selection*" appears in addition in which you have to select the connection (connection via HART or I^2C).

7 Maintenance and fault rectification

7.1 Maintenance

When used as directed in normal operation, VEGACONNECT 4 is completely maintenance free.

7.2 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) from our Internet homepage www.vega.com under: "*Downloads - Forms and certificates - Repair form*".

By doing this you help us carry out the repair quickly and without having to call back for needed information.

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and, if need be, also a safety data sheet outside on the packaging
- Please ask the agency serving you for the address of your return shipment. You can find the respective agency on our website www.vega.com under: "*Company - VEGA worldwide*"

8 Dismount

8.1 Dismounting steps

Since VEGACONNECT 4 is a mobile instrument, it is not necessary to take note of separate dismounting steps.

8.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the electronics to be easily separable.

WEEE directive 2002/96/EG
This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws. Pass the instrument directly on to a specialised recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects to persons and environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you have no possibility to dispose of the old instrument professionally, please contact us concerning return and disposal.

9 Supplement

9.1 Technical data

Electrical data	
Voltage supply from USB interface	5 V
Max. power consumption	500 mW
Galvanic separation between	• HART - USB • I^2C-Bus - USB

Ambient conditions	
Permissible ambient temperature	-20 … +60 °C (-4 … +140 °F)
Storage and transport temperature	-40 … +70 °C (-40 … +158 °F)

Electrical protective measures	
Protection rating	IP 40

Connection cable	
USB cable	for connection to the USB interface of the PC
I^2C bus cable	for connection to I^2C bus interface
Cable with 2 mm pins	for connection to CONNECT sockets
Cable lengths	
– USB cable	150 cm (59.055 in)
– I^2C bus cable	150 cm (59.055 in)
– Cable with 2 mm pins	150 cm (59.055 in)

Material, dimensions, weight	
Housing material	impact-resistant plastic (ABS)
Housing dimensions (LxBxH)	160x80x51 mm (6.299x3.15x2.008 in)
Weight with connection cables	325 g (0.716 lbs)

Approvals

Depending on the version, instruments with approvals can have different technical data.

For these instruments, the corresponding approval documents have to be taken into account. These are part of the delivery or can be downloaded under www.vega.com via "*VEGA Tools*" and "*serial number search*" as well as via "*Downloads*" and "*Approvals*".

9.2 Dimensions

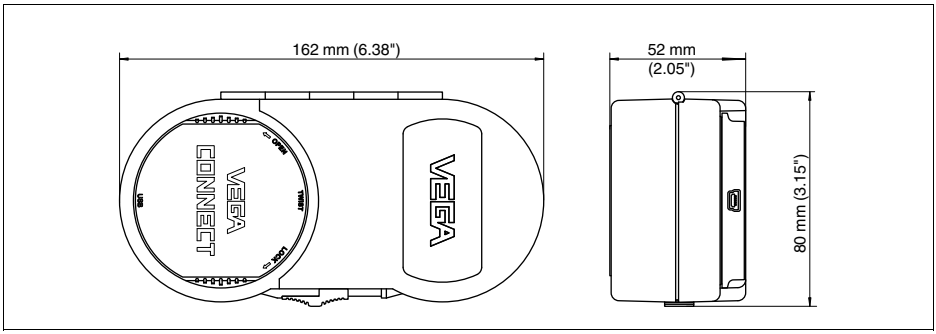


Fig. 12: Dimensions VEGACONNECT 4

9.3 Industrial property rights

VEGA product lines are global protected by industrial property rights.
Further information see http://www.vega.com.
Only in U.S.A.: Further information see patent label at the sensor housing.

VEGA Produktfamilien sind weltweit geschützt durch gewerbliche Schutzrechte.
Nähere Informationen unter http://www.vega.com.

Les lignes de produits VEGA sont globalement protégées par des droits de propriété intellectuelle.
Pour plus d'informations, on pourra se référer au site http://www.vega.com.

VEGA lineas de productos están protegidas por los derechos en el campo de la propiedad industrial.
Para mayor información revise la pagina web http://www.vega.com.

Линии продукции фирмы ВЕГА защищаются по всему миру правами на интеллектуальную собственность.
Дальнейшую информацию смотрите на сайте http://www.vega.com.

VEGA系列产品在全球享有知识产权保护。
进一步信息请参见网站<http://www.vega.com>。

9.4 Trademark

All the brands as well as trade and company names used are property of their lawful proprietor/originator.

INDEX

4
4 … 20 mA 7

C
Connection 12

D
Driver 9
DTM 7, 17
DTM Collection 9

F
Foundation Fieldbus 7, 12

H
HART 7
– Modem 7
– Resistor 11-12, 15

I
I²C interface 11
Interface converter 7

O
Online help 17

P
PACTware 7, 17
PLC 16
plics® 10
Power supply 7, 9
Profibus PA 7, 12

R
Repair form 18

S
Safety data sheet 18
Serial number 7

T
Type label 6

U
USB 9

Printing date:

VEGA Grieshaber KG
Am Hohenstein 113
77761 Schiltach
Germany
Phone +49 7836 50-0
Fax +49 7836 50-201
E-mail: info@de.vega.com
www.vega.com

All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

© VEGA Grieshaber KG, Schiltach/Germany 2009